

## REMARKS/ARGUMENTS

Claims 1-29 were previously pending in the application. Claims 3-4, 16-17, and 28-29 are canceled; claims 1, 5, 6, 8, 10, 14, 18, 19, 22, and 24 are amended; and new claims 30-31 are added herein. Assuming the entry of this amendment, claims 1-2, 5-15, 18-27, and 30-31 are now pending in the application. The Applicant hereby requests further examination and reconsideration of the application in view of the foregoing amendments and these remarks.

In paragraph 4, the Examiner rejected claims 1, 7, 10, 11, 13, 14, 20, 21, 24, 25, and 27-29 under 35 U.S.C. § 102(e) as being anticipated by Chilton. In paragraph 7, the Examiner rejected claims 1-6, 14-20, 28, and 29 under 35 U.S.C. § 103(a) as being unpatentable over Rode in view of Gates. In paragraph 11, the Examiner rejected claims 8, 9, 22, and 23 under 35 U.S.C. § 103(a) as being unpatentable over Chilton in view of Kim. In paragraph 13, the Examiner objected to claims 12 and 26 as being dependent upon a rejected base claim, but indicated that those claims would be allowable if rewritten in independent form. For the following reasons, the Applicant submits that all now-pending claims are allowable over the cited references.

Amended claim 1 is equivalent to original claim 4 rewritten in independent form and is directed to a coupler assembly adapted to provide optical coupling between an optical transceiver of a circuit pack connected to a backplane and an optical pipe of said backplane. The coupler assembly includes a movable optical element, wherein: the optical pipe is adapted to transmit optical signals through the backplane; and the movable optical element is adapted to move so as to accommodate misalignment between the backplane and the circuit pack to provide said optical coupling. The movable optical element has a movable mirror adapted to direct light between the optical transceiver and the optical pipe; and the movable mirror is a part of a MEMS device.

Rode discloses an optical coupler assembly for an optical backplane. On page 4 of the office action, the Examiner admitted that Rode's optical coupler assembly uses fixed optical elements, and not movable optical elements, to accommodate misalignment between the backplane and the circuit pack. Then, the Examiner stated that Gates teaches that movable MEMS mirrors can be used to couple and direct optical signals. The Examiner then proceeded to state that it would have been obvious to one of ordinary skill in the art to modify the optical coupler assembly of Rode by replacing its fixed lenses and mirrors with the movable MEMS mirrors of Gates. For the following reasons, the Applicant submits that the Examiner improperly used the combination of Rode and Gates to reject original claim 4.

Gates discloses a method of calibrating a MEMS mirror array such that the response of each MEMS mirror in the array to the applied voltage is known. Gates explains that his method is intended to supplement or replace the methods of training individual mirrors in optical cross-connect switches, in which, for each mirror in the switch, the voltages that need to be applied to direct an optical beam impinging onto that mirror to a desired location are determined (col. 3, lines 10-13).

First of all, the Applicant submits that Gates does not teach or suggest that his method can be used to somehow replace fixed optical coupling elements with movable MEMS mirrors. The method is simply intended to speed up the calibration process for the assembled MEMS switches by enabling the manufacturer not to test or train each and every mirror in the switch (col. 3, lines 46-50). Second, there is no teaching or suggestion in Gates that movable MEMS mirrors can somehow be used to couple an optical circuit pack to an optical pipe of a backplane. In fact, there is no mention whatsoever of optical backplanes or circuit packs in Gates. Likewise, there is no teaching or suggestion in Rode that anything else but fixed optical elements can be used to couple a circuit

pack to an optical pipe of the backplane, to which the circuit pack is attached. In fact, Rode carefully selects fixed optical elements (e.g., spherical lenses) to achieve high tolerance to lateral misalignment (see Rode's Fig. 3 and the associated text). As such, Rode teaches away from using movable optical elements in his coupler assembly.

In view of these facts, the Applicant submits that the Examiner's rejection of original claim 4 is based on an impermissible use of hindsight and should be withdrawn.


For all these reasons, the Applicant submits that amended claim 1 is allowable over Rode and Gates. For similar reasons, the Applicant submits that amended claim 14 is also allowable over Rode and Gates. Since claims 2, 5-7, 11-13, 15, 18-21, and 25-27 depend variously from claims 1 and 14, it is further submitted that those claims are also allowable over Rode and Gates.

New claims 30 and 31 are equivalent to claims 12 and 26, respectively, rewritten in independent form. Since the Examiner stated that claims 12 and 26 would be allowable if rewritten in independent form, the Applicant submits that claims 30 and 31 are allowable. Since claims 8-10 and 22-24 depend variously from claims 30 and 31, it is further submitted that those claims are also allowable.

In view of the above amendments and remarks, the Applicant believes that the now-pending claims are in condition for allowance. Therefore, the Applicant believes that the entire application is now in condition for allowance, and early and favorable action is respectfully solicited.

Respectfully submitted,

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